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30767 7590 02/05/2008 KEISLING PIEPE & SCOTT PLC 3739 STEELE BLVD, SUITE 340 FAYETTEVILLE, AR 72703			EXAMINER IP, SIKYIN	
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Please find below and/or attached an Office communication concerning this application or proceeding.

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/844,526
Filing Date: April 27, 2001
Appellant(s): BRUNSON, ROBERT WOOLLEY

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GROUP 1700

Meredith K. Lowry
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal briefs filed June 26, 2007 and February 5, 2007
appealing from the Office action mailed June 27, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct. Claims 1-8 have been deleted. Claims 9-24 have been withdrawn from consideration. Claims 25-30 are being rejected.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after Notice of Appeal contained in the brief is substantially correct.

The amendment filed on November 21, 2005 was filed with Notice of Appeal; thus, said amendment has not been entered.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows: First, appellant has never filed amendment to just rectify the 35 U.S.C. § 112, second paragraph rejection. The amendment filed on November 21, 2005 to rectify the 35 U.S.C. § 112, second

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paragraph rejection would be entered if the 35 U.S.C. §103 rejection is being reversed.

Second, there has never been an issue of inventorship. The section of form paragraph related to inventorship has been removed from the 35 U.S.C. § 103 form paragraph.

Third, the appealed claims 25-30 are rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5865913 to Paulin et al in view of USP 5447035 to Workman et al and further teaching of acknowledged prior art admission - not just Paulin and Workman as set forth by appellant.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,865,913	PAULIN	2-1999
5,447,035	WORKMAN	9-1995

Acknowledged prior art admission in instant specification [0005].

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the appellant regards as his invention.

Claims 26-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which appellant regards as the invention.

Claim 26 is indefinite because there is no step j in claim 25. Amendment filed on November 21, 2005 would be entered to rectify this rejection if the 35 U.S.C. §103 rejection is being reversed.

Claim Rejections - 35 USC § 103

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 25-30 are rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5865913 to Paulin et al in view of USP5447035 to Workman et al and further teaching of acknowledged prior art admission.

Paulin in col. 1, line 18 to col. 2, line 15 and Figure1 discloses steps of cryogenic heat treating a quantity of components by gradually lower the temperature of said quantity of components to -300 °F by liquid nitrogen, holding said quantity of components at -300 °F for a predetermined time according to the total mass of the processing load and material treated (col. 3, lines 55-59), gradually raising the temperature of said quantity of components to ambient temperature, tempering said quantity of components at 300 °F, gradually lower the temperature of said quantity of components to ambient temperature, and including steps repeatedly tempering in order

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to reduce residual stresses in the metal structure that has caused warpage of the metal structure (col. 2, lines 54-58). Paulin does not disclose the heat treated component is a brake rotor. Workman in col. 3, lines 15-50 discloses the substantially same cryogenic thermal cycling processing steps as Paulin could improve wear resistance for brake pad and the like article (col. 1, lines 9-23). The acknowledged prior art admission in [0005] of instant specification discloses brake rotor has same warpage problem due to heating/cooling cycles as Paulin (col. 2, lines 54-58). Paulin specifically and expressly teaches a method of cryogenic heat treating metal structure in order to eliminate residual stresses in metal structure in order to avoid warpage of the metal structure (col. 2, lines 54-58). Workman discloses it is known to cryogenic heat treating brake pad and like articles. The acknowledged prior art admission in [0005] discloses that steps to avoid brake rotor warpage is desired. In order to avoid brake rotor warpage, ordinary skill artisan would use the cryogenic heat treating method as taught by Paulin because as is evinced by Workman cryogenic heat treatment successively improves brake pad and like article properties.

With respect to repeatedly post temper cycles, that a two step combination and two obvious process steps is unpatentable when each lends properties to the final product known to be produced when the step is practiced alone, in the absence of evidence of coaction between the steps which produce an obvious result. In re Fortress (CCPA 1966) 369 F2d 1009, 152 USPQ 13.

With respect to the recited heat treatment conditions are being a function of the cross sectional area of brake components, which would have been inherently predetermined at static phase (Paulin col. 3, lines 53-58).

The limitation as recited in claim 27 reads on an ambient temperature.

The limitation as recited in claim 29 would have been inherently done by heating step of Paulin.

(10) Response to Argument

Appellant's arguments filed October 6, 2006 have been fully considered but they are not persuasive.

Appellant's argument in paragraph VII. A. of instant brief is noted. Amendment filed on November 21, 2005 would be entered to rectify this rejection if the 35 U.S.C. §103 rejection is being reversed.

~~disclosure of the cryogenic treatment of metal firearm barrels~~ It is improper to combine references without a teaching, motivation, or suggestion found in the prior art for combining the

Appellant argues that " references. As noted by the substantial authority covered in MPEP § 2145, § 2143.01, ~~and the~~ " But, appellant's attention is directed to cited references below that

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55 The accuracy of a firearm is directly tied to the heat generated by repeated firing and the wear of the firearm barrel. As the firearm barrels heat up from repeated firing they will warp off axis due to residual stresses in the metal structure. This movement though ever so slight when mea-

64 Firearm barrels and components treated with the controlled thermal profiling process of this invention have

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demonstrated that they have reduced residual stresses and increased wear resistance. This allows the firearm barrels and components to be fired with greater accuracy for longer periods of time.

Paulin discloses "

”
,

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Thermal cycling processes affect the wearability of metal by four known mechanisms: Conversion of austenite to martensite; precipitation hardening which increases Rockwell hardness; formation of fine carbide particles; and residual stress relief.

Workman discloses "Another object is to provide for a thermal cycling of brake pads which improves the wearability of the pads." and

Acknowledged prior art admission discloses

[0005] Although deep cryogenic tempering has been applied to a few specific applications, the process has not previously been contemplated for brake components such as rotors and drums. Due to the specific operating environment of brake components, the desired set of structural properties is unique. For example, warpage of brake rotors often occurs, wherein the warpage results from elevated temperatures and non-uniform pressures being applied to a rotor surface.

" As are evinced by cited prior

arts of record that thermal cycling processes have been known to correct warpage and wear problems. In re Icon Health and Fitness, 83 USPQ2d 1746 (Fed. Cir. 2007).

Nowhere does the examiner particularly identify any suggestion, teaching, or motivation to combine the prior art references, nor does the examiner make specific findings concerning the identification of the relevant art, the level of ordinary skill in the art, the nature of the problem to

Appellant argue that "be solved, or other findings to support a proper obviousness analysis. ~~See In Re Deutscher, 36~~" Appellant's attention is direct to 35 U.S.C. §103 rejection above (attached below for appellant):

~~heating/cooling cycles as Paulin (col. 2, lines 54-58).~~ Paulin specifically and expressly teaches a method of cryogenic heat treating metal structure in order to eliminate residual stresses in metal structure in order to avoid warpage of the metal structure (col. 2, lines 54-58). Workman discloses it is known to cryogenic heat treating brake pad and like articles. The acknowledged prior art admission in [0005] discloses that steps to avoid brake rotor warpage is desired. In order to avoid brake rotor warpage, ordinary skill artisan would use the cryogenic heat treating method as taught by Paulin because

Appellant argues that Paulin teaches away from brake pad. But, Paulin teaches to eliminate warpage and improve wear resistance of metal structure by thermal cycling process (col. 2, lines 54-58).

Appellant argues that brake material of Workman is made of "semi-metallic". But, "semi-metallic" is not excluded by "metallic" as claimed in rejected claims 25-30.

Appellant's argument in instant brief, page 11 of 42, is noted. But, cited references are directed to avoid warpage and improve wear resistance by thermal heat treatment (see responses above).

~~noted by Workman et al. (Col. 2, Line 57) is the harder form of steel. Therefore, the process of~~
~~Paulin et al. by sheer repetition of the cryogenic treatment process would produce more martensitic~~
Appellant argues that "steel thus making the end product harder. ~~As noted by Workman et al. (Col. 3, Line 6-7), or "~~

But, appellant fails to provide factual evidence to support his said argument. Moreover, metal structure of Paulin is not quenching/cooling from austenitic temperature to form martensite. Paulin cools the metal structure from ambient/room temperature (Figures 1 and 2). Moreover, Paulin teaches to increase metal structure wear resistance by reducing residual stress (col. 3, lines 1-5).

~~determination of these values is obvious under §103(a). The disclosure of Paulin et al. teaches the~~
~~calculation of the descent rate based upon the total mass of material. (Col. 3, Lines 53 - 58). Paulin~~
~~et al. does not disclose the use of the cross sectional area for determining the descent rate, nor does~~
Appellant argues that " it teach the computation of the stay time and ascent rate based upon these factors. ~~Further~~ " But,

it is general knowledge that mass is product of volume and density. Volume equals cross-sectional area x length (height).

~~Surface area and mass are critical factors in determining adequate and thorough heating~~
Appellant argues that " and cooling of materials. ~~In the present invention, the rotors of Applicant are more appropriately. "~~

But, first there is no specific novel brake rotor structure being claimed. Second, prior

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arts successfully heat treated their products by specific material, temperature, and time.

Third, Paulin sets heat treatment parameters according to material mass, configuration, and materials (Col. 3, lines 48-58 and col. 3, line 67 to col. 4, line 7). Fourth, there is no limitation in instant appealed claims to relate how temperature and time set according to surface area of the rotors. Fifth, there is no factual evidence that the instant surface area and mass are critical factors that ordinary skill artisan needs special instruction to determine the heat treatment conditions.

~~the prior art, as shown in Figure 2 of Paulin et al., Figure 2 in Workman et al., and Figure 2 of Applicant's disclosure, the stay time at the lower and higher temperature points differs for each teaching with the stay time of Applicant's invention being substantially longer than what is taught by Workman et al. and Paulin et al. This distinction is important because the result of the longer stay time is that the brake rotor of Applicant's invention has increased lattice changes to its molecular structure. Further, the increased stay time based upon the mass and cross-sectional~~

Appellant argues that “its molecular structure. ~~Further, the increased stay time based upon the mass and cross-sectional~~” But,

appellant's argument is immaterial because none of appealed claims recite specific “stay time” or how to determine “stay time”. Moreover, if argued “stay time” is essential, why it is not in claims?

Appellant's repeated arguments with respect to claims 26-30 are noted.

Examiner reiterates the responses above for the same arguments to claim 25.

Appellant's argument in instant brief, page 20 of 42, is noted. But, ambient temperature disclosed by references of record does not exclude 100 °F.

Appellant argues that limitation in instant claim 28 has not been addressed. But, it is law of nature that heating temperature from instant step d (-300 °F) to instant step e (300 °F), the heating temperature has to pass -100 °F in order to get to 300 °F.

Appellant argues that cited references fail to disclose step of moving cryogenic coiled metal structure to tempering oven. Appellant's attention is directed to Figure 1 of

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Paulin, for example, that the metal structure is heat treated at -100 °F then tempered at +300 °F would read on transporting the metal structure from cooling chamber to tempering chamber/oven.

Appellant's argument with respect to repeatedly post temper cycles is noted. But a two step combination and two obvious process steps is unpatentable when each lends properties to the final product known to be produced when the step is practiced alone, in the absence of evidence of coaction between the steps which produce an obvious result. In re Fortress (CCPA 1966) 369 F2d 1009, 152 USPQ 13.

Paulin et al. teaches that the use of liquid nitrogen has its limits, which sometimes causes thermal shock. (Col. 1, Line 47 – 48). Despite this unwanted side effect, Paulin et al. utilizes liquid nitrogen as the means for cooling the gun barrels. If the substitution of gaseous nitrogen were obvious to one skilled in the art, Paulin et al. would have made this substitution to prevent thermal

Appellant argues that “ shock. However, since Paulin et al. did not make this substitution, it therefore, must not be obvious ”

But, appellant fails to provide factual evidence that liquid nitrogen would cause thermal shock when metal structure is cooled gradually (Paulin, col. 3, lines 25-33 below).

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cryogenic processing and heat treating equipment. The firearm barrels and components are placed in a treatment chamber which is connected to a mechanical pumping and/or supply of cryogenic fluid such as liquid nitrogen or another like fluid. Exposure of the chamber of the cryogenic cooling system lowers the temperature of the firearm barrels and components until the desired temperature is achieved. Control devices of a common nature are employed to ensure that the cooling is gradual which averts damage to the firearm barrels and components, which may occur of subjected to rapid cooling. As stated above, this machinery is known to those skilled in the art, and does not add to the novelty of the process. Heating of the firearm barrels and components can also be accomplished in any manner.

Moreover, Paulin is not limited to use only liquid nitrogen.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

S. Ip

/Sikyin Ip/

Primary Examiner, Art Unit 1793

Conferees:

Roy V. King

Handwritten signature of Roy V. King in cursive script.Handwritten signature of Romulo Delmendo in cursive script.

Romulo Delmendo